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AUTHOR Ellis, Rod
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ABSTRACT

The oral interaction hypothesis, proposed by Long and investigated by Pica, in second language (L2) acquisition is critiqued. The interaction hypothesis advances two major claims about the role of interaction in L2 acquisition: (1) comprehensible input is necessary for L2 acquisition; and (2) modifications to the interactional structure of conversations that take place in the process of negotiating a communication problem help make input comprehensible to an L2 learner. Changes that have taken place since the initial formulation of the hypothesis are reviewed, as is evidence cited in support of the hypothesis. In view of theoretical arguments and empirical counter evidence, a revised version of the hypothesis is proposed. The revisions suggest a theoretical account of how input made comprehensible through interactional modification results in acquisition, and also takes into account the basic procedures of noticing, comparison, and integration. Contains approximately 75 references. (LB)

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THE INTERACTION HYPOTHESIS: A CRITICAL EVALUATION

Rod Ellis

Temple University Japan

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Introduction

There is now widespread acceptance that the oral interactions in which second language (L2) learners participate provide one of the main sources of data for L2 acquisition. In the case of naturalistic acquisition, the importance of face-to-face interaction with other speakers of the L2 is self-evident. In the case of classroom acquisition, the role of interaction is perhaps less dominant but is nevertheless sufficient for Allwright (1984;156) to call it 'the fundamental fact of pedagogy'. Allwright perhaps exaggerates when he claims that 'everything that happens in the classroom happens through a process of face-to-face interaction' (for, after all, learners often spend a lot of time reading and writing), but it remains true that 'teaching' can be profitably viewed as interaction that supplies learners with opportunities for learning. The study of the relationship between interaction and L2 acquisition, therefore, constitutes one of the main ways in which second language acquisition research (SLA) can inform pedagogy.

The interaction hypothesis provides one theoretical account of this relationship. Other theories also exist (e.g. theories based on the contribution of universal grammar, cf. White, 1990, and theories attributing a more direct role to language production, cf. Pienemann, 1985). However, the interaction hypothesis has received considerable attention during the last decade, it has figured prominently in second language classroom research and it has served as the basis for a number of pedagogical recommendations. For these reasons it warrants careful scrutiny.

The purpose of this paper, then, is to subject the interaction hypothesis to critical evaluation. The paper will begin with an account of the hypothesis, with due attention to the inevitable changes which have taken place since its initial

formulation. The next section will consider the evidence that has been cited in support the hypothesis. The section following will attempt an evaluation of the hypothesis in the light of both theoretical arguments and empirical counter evidence. Finally,a revised version of the hypothesis will be proposed.

The Interaction Hypothesis

The interaction hypothesis advances two major claims about the role of interaction in L2 acquisition:

> Comprehensible input is necessary for L2 acquisition.
>
> Modifications to the interactional structure of conversations which take place in the process of negotiating a communication problem help to make input comprehensible to an L2 learner.

The origins of these claims lie partly in the work of Stephen Krashen and partly in that of Evelyn Hatch. Krashen (1977;1980) argued that the subconscious process of 'acquisition' (as opposed to the conscious process of 'learning') occurs when the learner is focussed on meaning and obtains comprehensible input. He emphasised the importance of 'simple codes' (e.g. foreigner and interlanguage talk) and of extralinguistic context for making input comprehensible. He also claimed that language production plays no direct part in 'acquisition'. Hatch (1978) used a 'discourse analysis' approach to study the interactions involving naturalistic child and adult L2 learners and concluded that the regularities which have been shown to exist in the way which learners acquire the grammar of an L2 were the direct result of the kinds of interaction in which they participated. Suggesting that the order of acquisition reflects the differential frequency with which features occur in the

Table 5.3 Interactional modifications involved in the negotiation of meaning

Interactional feature	*Definition*	*Example*
Clarification requests	Any expression that elicits clarification of the preceding utterance.	A: She is on welfare. B: What do you mean by welfare?
Confirmation checks	Any expression immediately following the previous speaker's utterance intended to confirm that the utterance was understood or heard correctly.	A: Mexican food have a lot of ulcers? B: Mexicans have a lot of ulcers? Because of the food?
Comprehension checks	Any expression designed to establish whether the speaker's own preceding utterance has been understood by the addressee	A. There was no one there. Do you know what I mean?
Self-repetitions:		
(1) repairing	The speaker repeats/ paraphrases some part of her own utterance in order to help the addressee overcome a communication problem	A: Maybe there would be— B: Two? A: Yes, because one *mother* goes to work and the other *mother* stays home.
(2) preventive	The speaker repeats/ paraphrases some part of her own utterance in order to prevent the addressee experiencing a communication problem.	A: Do you share his feelings? Does anyone agree with Gustavo?
(3) reacting	The speaker repeats/ paraphrases some part of one of her previous utterances to help establish or develop the topic of conversation.	A: I think she has *a lot of money*. B: But we don't know that? A: But her husband *is very rich*.
Other-repetitions:		
(1) repairing	The speaker repeats/ paraphrases some part of the other speakers utterance in order to help overcome a communication problem.	A: I think the *fourth family*. B: Not the *fourth family*, the third family.
(2) reacting	The speaker repeats/ paraphrases some part of the other speaker's utterance in order to help establish or develop the topic of conversation.	A: I think *she has three children*. B: This is the thing. *She has three children*.

Source: Based on Pica and Doughty (1985a)

Table 1: Interactional modifications in the negotiation of meaning (based on Pica and Doughty, 1985)

input, she argued that the frequency of these features is determined by the efforts which native speakers and learners make to establish and develop a topic through interaction.

The interaction hypothesis itself is most clearly associated with the work of Michael Long. Long (1980) reported on the input and interactional features of native speaker talk to sixteen non-native speakers (all Japanese) in interview-type situations. Input features consist of various purely linguistic aspects of foreigner talk such as breadth of vocabulary used and overall sentence complexity. Interactional features refer to communicative aspects of foreigner talk such as temporal markings and various discourse and topic-incorporation functions (cf. Table 1). Using native-speaker/native-speaker conversations as baseline data, Long discovered that foreigner talk entailed few input modifications but numerous interactional adjustments. In a subsequent article Long (1983) embraced Krashen's views about the role of comprehensible input, arguing that (1) access to it is characteristic of all cases of successful first and second acquisition, (2) greater quantities of comprehensible input seem to result in faster acquisition and (3) lack of access to it results in little or no acquisition. Comprehensible input is seen, therefore, as necessary for acquisition, at least for the beginning learner. In the same article, Long argued that modifications to the interactional structure of conversation were 'the most important and widely used' way of making input comprehensible (p.342). He suggests that these are specially facilitative of acquisition because they help to make unfamiliar linguistic input comprehensible. Long does not present any arguments for differentiating the effects of the various interactional modifications, so it must be presumed that it is the quantity rather than quality of the modifications that is important for acquisition. Indeed, as we shall see, the empirical research that has fed off the interactional hypothesis has been based on this assumption.

Long (1983) also considers one of the conditions that promotes the negotiation of meaning. He reports a study (Long,1980) in which he found a statistically significant higher frequency of various interactional features in NS-NNS as opposed to NS-NS conversations in tasks which required information exchange (i.e. two-way or jigsaw tasks) but not in tasks which did not require any information exchange (i.e. one-way or decision-making tasks). We might add the following to our description of the interaction hypothesis,therefore:

> Tasks in which there is a need for the participants to exchange information with each other promote more interactional restructuring.

It follows that information-exchange tasks also aid comprehension and L2 acquisition.

The interaction hypothesis is also closely associated with the work of Teri Pica. Pica's main contribution has not been in the area of theory construction but in the execution of carefully designed experimental studies designed to test the claims of the interaction hypothesis. As such,it will be considered more fully in the next section. Pica (1987) has,however,extended the interaction hypothesis in one major way. She emphasises the importance of the social relationship between the participants as a determinant of interactional modifications:

> Underlying the need for mutual understanding and the opportunity to modify and restructure social interaction ... is a social relationship in which learners and their interlocutors are aware of their unequal linguistic proficiencies in the second language,but nevertheless see themselves as having equivalent status with regard to meeting their needs and fulfilling their obligations as conversational participants. (p.4)

We might, then, add the following to our description of the interaction hypothesis:

> A situation in which the conversational partners share a symmetrical role relationship affords more opportunities for interactional restructuring.

It follows that equality of status between the interactants is also facilitative of comprehension and acquisition.

The interaction hypothesis can now be summarised as an hierarchical three-part statement (see Table 2). The first part advances the central claim that learners need to comprehend input in order to develop their interlanguages. The second part states that opportunities to modify the structure of a conversation promotes comprehension. The third part concerns the conditions that create oppotunities for restructuring.

An examination of Long's and Pica's later publications indicates continued adherence to the interaction hypothesis and a preparedness to put forward a number of proposals for pedagogy on the basis of it. Thus Long and Crookes (1987) argue that teachers should make efforts to use fewer display questions because these inhibit the restructuring of interaction that promotes acquisition through comprehensible input. Elsewhere (e.g. Long and Porter, 1985), Long has argued in favour of group work because it promotes greater opportunity for modifying the structure of interactions. Long (1989) has also argued in favour of certain kinds of tasks on the grounds that they produce more and more useful negotiation work. In addition to reaffirming the importance of two-way over one-way tasks, Long also proposes that closed tasks (i.e. a task with a single or a finite set of correct solutions) work better than oper tasks. In all these cases, Long refers to the pyscholinguistic rationale for his proposals. This

(1) Comprehensible input is necessary for L2 acquisition (= the input hypothesis).

(2) Modifications to the interactional structure of conversations which take place in the process of negotiating a communication problem help to make input comprehensible to an L2 learner.

(3) a. Tasks in which there is a need for the participants to exchange information with each other promote more interactional restructuring.

b. A situation in which the conversational partners share a symmetrical role relationship affords more opportunities for interactional restructuring.

Table 2: The Interactional Hypothesis

rationale is the interactional hypothesis. Pica (1990) also continues to advocate the need for creating the classroom conditions in which the negotiation of meaning can take place, again citing the interactional hypothesis as the theoretical justification.

In two respects, though, Long and Pica's theoretical position does appear to have developed somewhat. First, although Long continues to assert that comprehensible input is necessary for acquisition, he now clearly recognizes that it may not be sufficient (cf. Long, 1989; 10). He does not indicate, however, when or in what ways it is insufficient. We are not told whether it is insufficient because its contribution is dependent on some other factor or factors (e.g. Krashen's affective filter) or whether it is insufficient because it cannot account for the whole of acquisition (as White (1987) argues).

Second, Long now clearly acknowledges that interaction promotes L2 acquisition not only by supplying comprehensible input but also by providing the learner with opportunities for production. Drawing on the comprehensible output hypothesis[2] (Swain (1985)) he recognises that interlanguage development can take place when learners are 'pushed' to improve their output. In this respect certain interactional modifications may be more helpful than others. For instance, requests for clarification (e.g. 'Pardon') 'stretch' the learner by making her clarify what she has said, whereas confirmation checks do not because they solve the communication problem for the learner. Pica, too, has embraced the output hypothesis. She has been able to demonstrate that although NNSs are less likely to modify their original output than NSs as a result of a communication problem, they do nevertheless modify their own and their interlocutor's productions both semantically and structurally (cf. Pica, 1990, for an excellent survey of her own work). She also shows that certain types of discourse signals

(e.g. requests for clarification) are more likely to promote output modifications. In effect, both Long and Pica are now advancing arguments in favour of the qualitative effects of different types of adjustments. It should be noted, however, that these qualitative effects apply only to production. Where comprehension is concerned it is the sheer quantity of modifications that still appears to count.

The main difference between the early and later work of Long and Pica is that in the latter the interaction hypothesis is no longer seen as the only or even the major explanation of L2 acquisition. It remains however an important element in their psycholinguistic rationale for pedagogic intervention. This paper will focus only on the claims made on behalf of interactional restructuring and comprehension.

A look at the evidence

The evidence in support of each part of the interactional hypothesis will be considered separately. It should be noted that because the three parts of the hypothesis are arranged hierarchaically, the evidence to be examined is not all of equal weight. To justify the hypothesis it is crucial to demonstrate the first part i.e. to show that comprehensible input is necessary for acquisition (the input hypothesis).

There is, in fact, no direct evidence to support the input hypothesis. Long (1983) comments:

> Like any genuine hypothesis, the input hypothesis has not been proven. There has been no direct test of it to date.

The situation is no different today. It has not even been demonstrated that comprehending messages in an L2 contributes to the acquisition of new linguistic knowledge let alone that

comprehension is necessary for its acquisition. A number of studies have reported a relationship between the frequency of features in the input and their acquisition (e.g. Larsen-Freeman, 1976 and Lightbown, 1983) but such studies do not address the input hypothesis as they do not show that the input containing the features was comprehensible to the learners. Chaudron (1988), reviewing studies that have investigated L2 comprehension in a classroom setting, concludes that there is only an 'inkling' of a relationship between comprehensibility and learners' progress. This is an exaggeration; there is no direct evidence of any relationship at all.

The absence of direct evidence, however, does not warrant the rejection of the input hypothesis - as Long (1983) is quick to assert. Indeed, if the weight of indirect evidence is sufficient, the hypothesis can be sustained. Krashen (1985) and Long (1983) point to several kinds of indirect evidence. These are summarised in Table 3. It is difficult to assess this evidence. Some of it does not speak to the input hypothesis at all. For example, there is no study that links foreigner talk to L2 acquisition. Some of it is extremely dubious. For example, the claim that the methods that are supposed to work (e.g. Total Physical Response) do so because they supply more comprehensible input than the methods that are not supposed to work (e.g. audiolingualism) can be disputed both on the grounds that the comparative method studies are seriously flawed (a point Long, but not Krashen, acknowledges) and on the grounds that there is no evidence that the successful methods actually result in more comprehensible input. Some of the evidence is controversial. For instance, researchers do not agree about the role of caretaker talk in L1 acquisition (cf. Gleitman et al, 1984). Some of the evidence has also been disputed. Hammerly (1987), for instance, takes a very different view of immersion programs, claiming that they result in pidginization. Even some of the stronger evidence is open to

Kind of evidence	Brief explanation
Caretaker speech	Caretaker speech to young children is roughly tuned to the children's receptive abilities and is motivated by the need to aid comprehension.
Foreigner talk	Foreigner talk to NNSs is also roughly tuned and functions as an aid to comprehension.
Silent period	Some young children go through a 'silent period' in L2 acquisition. During this period they do not produce but do learn the L2.
Age differences	Older children acquire faster because they obtain more comprehensible input.
Comparative method studies	The studies show that methods that supply plenty of comprehensible input work better than those that supply little.
Immersion programs	Immersion programs have generally been found superior to foreign/ second language programs - again because they supply plenty of comprehensible input. Also, additional exposure to the L2 outside the classroom does not enhance learning, presumably because this does not supply comprehensible input.

Bilingual program	The success of different kinds of bilingual programs reflects the extent to which they supply comprehensible input.
Delayed L1 and L2 acquisition	Studies of children in both L1 and L2 acquisition who are deprived of comprehensible input (e.g. because their parents are deaf) show that acquisition is delayed or non-existent.

Table 3: Indirect evidence in support of the input hypothesis

dispute. Some adults, for instance, have proven to be very successful learners even though they had no access to comprehensible input in meaning-focussed communication. It is possible that they worked on the input they received to make it comprehensible (e.g. with the help of a bilingual dictionary) but this involves a very different concept of comprehensible input from that advanced by the input hypothesis. At best the indirect evidence cited provides only weak support in favour of the necessity of comprehensible input. Long's (1983;341) conclusion that 'it is sustained because the predictions it makes are consistent with the available data' is probably not warranted and a safer, more conservative conclusion might be that the hypothesis still awaits confirmation.

Let us now consider the second claim of the hypothesis. What evidence is there to support the view that input obtained from interactional modification is most easily comprehended? Two sets of studies are relevant here - studies which have investigated the effects of input simplifications on comprehension and studies which have investigated whether interactional modifications are especially effective.

In general, researchers have concentrated on describing the way in which input is modified in foreigner and teacher talk and have rarely investigated the effects such modifications have on comprehensibility. However, a number of studies indicate that input modifications aid understanding of both spoken and written texts. These studies have been reviewed by Long (1985) and Chaudron (1985;1988). They provide evidence to suggest that (1) rate of speech (e.g. Kelch, 1985), (2) reduction in syntactical complexity (e.g. Johnson, 1981 and Blau, 1982) and (3) increased redundancy (e.g. Chaudron, 1983) result in better comprehension by L2 learners. However, there are problems. First, other studies provide counterfactual evidence. Dahl (1981), for instance, found that L2 learners judgements of the

rate of spoken messages did not correlate with the actual speech rate. Speidel et al (1985) found that simple syntax in stories did not improve the reading comprehension of grade 2 pupils in Hawaii. Second, in many of the studies (such as Long 1985) a number of different aspects of input (speech rate, syntax, lexis, discourse) were simplified, making it difficult to determine precisely which aspects contributed to enhanced comprehension.[3] Chaudron (1983) has also noted that teachers' attempts to simplify may result in too much redundant and confusing information which can inhibit rather than promote comprehension. A safe conclusion is that input modifications probably do facilitate understanding, but precisely which modifications work best and in which combinations remain uncertain.

The studies referred to above, however, are not of direct relevance to the interaction hypothesis, which states that input modifications which derive from attempts to negotiate understanding work best. A study by Pica, Young and Doughty (1986) has addressed this claim directly. For this reason it is an important study and will be considered in some detail. Sixteen low-intermediate learners were divided into two groups. One group received directions requiring them to choose and place items on a small board illustrated with an outdoor scene. These directions were based on those produced in native-speaker/native-speaker interaction but had been systematically premodified with the result that they were longer, more redundant and less complex. The other group received the baseline directions, but were given opportunities to seek verbal assistance if they did not understand. In this way, the researchers aimed to compare the effects of premodified and interactionally adjusted input on comprehension, which they measured as the number of the correct learner responses to the directions. The results showed that interactional modifications did result in higher levels of comprehension. The input derived from the restructured

interactions proved to be (1) quantitatively greater, (2) more complex and (3) more redundant than both premodified and baseline input. Furthermore, a detailed analysis of individual directions showed that 'modifications of interaction were most effective in achieving comprehension when the learners had difficulty in understanding the input but were superfluous when the input was easily understood' (p. 747). This study is often cited as providing strong support for part two of the interaction hypothesis. It is, however, seriously flawed in one major respect. It is impossible to tell whether the advantage shown for the interactionally modified input arose as a result of the greater input which it supplied or, as Pica et al wish to claim, as a result of the opportunities for negotiating meaning. We need to take note of the fact that it was the researchers themselves who determined the quantity of the premodified input and to recognise that we cannot judge whether the premodified input would have worked as well (or even better) had it been as plentiful as the interactionally modified input.

A subsequent study (Pica, 1989) addressed this problem. This study compared the effects of interactionally generated input with premodified input which contained the same amount of original and repeated input and took the same length of time to present. In this case, then, the two conditions differed only in whether there were opportunities to negotiate. As Pica takes pains to point out the premodified input in the second study was based on the negotiated input rather than on the researcher's intuitions about what constituted comprehensible input. The premodified and interactionally adjusted input resulted in comprehension scores of 81% and 88% respectively - a difference that was not statistically significant. However, a post-hoc analysis of the results showed that for those learners who were rated as having lower comprehension ability by their teachers, the opportunity to interact was beneficial.

Pica concludes that opportunities for negotiation may be most beneficial for learners in the early stages of L2 acquisition. 4

What general conclusions can we reach regarding the second claim of the interaction hypothesis? At best, the research to date only suggests that simplified input helps comprehension. Also, much more work needs to be done before we can safely conclude if and when interactionally modified input works best. But, on balance, this part of the hypothesis looks promising. It is worth noting that L1 researchers (e.g. Ellis and Wells, 1981) have found that the input made available by parents with fast-learning children does not differ significantly on purely linguistic measures (i.e. what Long (1980) has called input features) from that made available by parents of slow-learning children, but differences are evident on a number of interactional measures (e.g. acknowledgements and expansions).

Perhaps the most convincing research has focussed on part three of the interaction hypothesis (i.e. the conditions that promote interactionally modified discourse). There is now ample testimony to the distorted nature of the discourse that occurs in teacher-dominated lessons and to the non-availability of opportunities for modifying the structure of the classroom interactions that occur in them (cf. Long and Sato, 1983; Ellis, 1984). There have also been a number of interesting studies, building on Long's 1980 study, which have attempted to identify which general properties of tasks promote negotiation (e.g. Gass and Varonis, 1985; Pica and Doughty, 1985a and 1985b and various papers in Day, 1986). Again, though, it is wise not to place too much store on the results that have been obtained, as there are studies which also show that teacher-dominated discourse need not be totally devoid of interactional negotiation (cf. Van Lier, 1988), while much work remains to be done to establish which task factors are relevant to interaction and how these factors inter-relate

in determining discourse outcomes. Also, research directed at part three of the hypothesis does not constitute a test of the essential elements of the hypothesis.

This review of the evidence that has been cited in support of the various parts of the interaction hypothesis indicates the need for caution. It is now a decade since the hypothesis was originally formulated and yet there is still no direct evidence to link interaction to acquisition and precious little to demonstrate that it promotes comprehension. This, perhaps, is not so surprising, nor very worrying, as SLA and, in particular, classroom SLA is still in its infancy. A decade, after all, is not long. Also, the absence of supportive research does not warrant the abandonment of a hypothesis that, in many ways, has contributed substantially to our current understanding of how learning takes place in the classroom context.

An evaluation of the interactional hypothesis

We have now considered the nature of the theoretical claims advanced by the interactional hypothesis and have also examined some of the empirical evidence which has been cited in support of it. In this section, we will take a look at a number of theoretical objections and some counter-evidence to the first two parts[5] before arriving at a final evaluation of the hypothesis.

Is comprehensible input necessary for acquisition?

Many of the theoretical objections have focussed on part one of the hypothesis - the claim that comprehensible input is necessary for acquisition. Two rather different arguments, representing a weak and a strong attack on this position, have been advanced.

The weak objection is based on the view that although comprehensible input is necessary for acquisition it is not sufficient (which, as we have seen, is a point Long now acknowledges). Sharwood Smith (1986;241) argues that the processes of comprehension and acquisition are not the same. He suggests that input has a 'dual relevance' - there is input that will help the learner to interpret for meaning and there is input that she will use to advance her interlanguage. Sharwood Smith goes on to consider the different nature of the processes involved. In the case of comprehension, surface input is only briefly registered, as the learner rapidly recodes into 'deeper semantic and pragmatic codes' in which the message is then stored. In the case of acquisition the learner needs to undertake both a surface structure analysis and a semantic representation of the input. The input has to be held in memory sufficiently long for a comparison between its representation and whatever representation is provided by the rules of the learner's current grammar to be carried out. Without such a comparison no restructuring of the current grammar can take place. A somewhat similar position has been taken up by Faerch and Kasper (1986). They argue that acquisition only occurs when there is a 'gap' between the input and the learner's current knowledge and, crucially, when the learner perceives the gap as a gap in knowledge.

A characteristic of the weak objection is the rejection of any role for simplified input in L2 (or L1) acquisition. Sharwood Smith (1986) argues that simplified input functions as an aid to comprehension but not to acquisition. He refers to research by Bates (1982) which indicates that the characteristics of motherese (one kind of simplified input) are controlled by the child rather than the caretaker. White (1989) argues that simplfied input will not help the learner to discover certain facts about the target language, such as the coreference possibilities of the English pronoun system. She points out that input consisting of simple sentences (e.g. 'Jane washed

her') will not help the learner to discover how to treat pronouns in complex sentences (e.g. 'Jane watched television before she had dinner'). Both Sharwood Smith and White argue that simplified input is detrimental to language acquisition because it deprives the learner of useful structural information about the target language grammar.

These arguments are surely mistaken, particularly where simplified input derived from interactionally adjusted conversations is concerned.[6] Bates (1982), on whom Sharwood Smith sets considerable store, is wrong - there is evidence from Wells (1985) that parents increase the frequency of specific grammatical features just <u>before</u> these first appear in their children's speech. White is wrong to assume that simplified input is incapable of revealing facts such as the rules governing pronominal coreference. Consider the following constructed but totally feasible conversationsal exchange:

NS: Jane watched television before she had dinner last night.
NNS: Before who had dinner?
NS: Before Jane had dinner. Jane watched TV before Jane had dinner.
NNS: Oh, I see.

White seems to characterise simplified input entirely in terms of reduction in grammatical complexity and to ignore other aspects. But, as the above exchange illustrates, interactional modifications often work on quite complex strings, helping to make the grammatical relationships that exist transparent and, therefore, easier to acquire (cf. Pica, 1990, for examples of how this happens in real conversations involving learners). The simplified input derived from interactional modifications, then, certainly need not deprive the learner of useful structural data, as both Sharwoord Smith and White claim.

It does not follow, of course, that modified input, even when interactionally derived, results in acquisition - as we have already noted in the previous section. Sato (1986) investigated the role of conversational modifications arising out of communication breakdown in two Vietnamese learner's naturalistic acquisition of past time reference (PTR) in English. Neither learner acquired past tense grammatical markers and Sato suggests that this might have been because both learners were able to communicate PTR effectively precisely because they were given substantial interactional support. In other words, the conversational interaction removed the need to acquire past tense grammatical markers. Sato concludes that conversational interaction may facilitate the acquisition of some structures but not others. This is an interesting conclusion because it conforms to the findings of other research which has shown that morphological aspects of English (such as past tense markers) are 'fragile', i.e. typically not acquired in communicatively-rich learning environments) and, indeed, are resistant to acquisition even in advanced learners (cf. Bardovi-Harlig and Bofman, 1989).[7]

In rejecting Sharwood-Smith's and White's arguments regarding the null contribution of modified input, we need to be careful not to overstate its importance. At best, we can say that it may help acquisition. Also, the argument advanced by Sharwood Smith, Faerch and Kasper and Sato that the processes of comprehending and acquiring are distinct and that input/interaction that works for comprehension may not work for acquisition still stands. Apart from Sato's study already referred to, there is other evidence to support this position.

Ellis (forthcoming) asked two groups of upper intermediate adult learners (one Black South African and the other Indonesian) to read an 'English' text which had been rewritten so as to introduce a number of non-English grammatical rules

(i.e. a zero plural morpheme rule and a number of German word order rules). The task was administered as a faster reading exercise and the learners' reading speeds and comprehension measured. On completion of the task the learners were asked to write down in as much detail as possible anything they had noticed about the grammar of the text they had read. A 'grammar score' for each learner was based on the accuracy and detail of their written comments. For the South Africans there was a statistically significant inverse relationship between reading speeds and comprehension scores on the one hand and grammar scores on the other. In other words, the faster readers and more successful comprehenders noticed less about the grammar. For, the Indonesians no such relationship was found. Ellis suggests that the difference between the two groups reflects differences in the way they approached the reading task. The Indonesians had received intensive training in how to read for meaning and, therefore, may have focussed primarily on comprehending the text. The South Africans had received no such training. Many read very slowly and may, therefore, have given themselves more opportunity to perceive the 'new' grammatical features.

Further evidence in support of the view that the availability of comprehensible input does not guarantee acquisition is provided by recent studies which have investigated grammar learning in 'communicative' classrooms (cf. Ellis, forthcoming for a review). Swain (1985) reported that early immersion students in Canada performed poorly on tests of grammatical competence. Hammerly (1987) reviewed six studies of French immersion, all of which showed that although the learners developed good listening and reading skills, they remained far from 'linguistically competent'. Hammerly argued that comprehensible input results only in 'a very defective and probably terminal classroom pidgin' (p.397). Spada and Lightbown (1989) provide evidence to suggest that an intensive communicative ESL program in Quebec (5 hrs 5 days a week for 5

months) also resulted in low levels of grammatical acquisition (e.g. only 50% accuracy on plural-s, an early-acquired morpheme). These programs should not be considered failures, however, as they did result in considerable fluency and confidence in the learners' ability to use the L2. They suggest that comprehensible input is by itself not sufficient for acquisition of high levels of grammatical proficiency. One explanation for this is that the learners in such programs do not notice grammatical features in the input they comprehend. Such a conclusion is supported by the results of other studies (e.g. Spada, 1987) which suggest that drawing learners' conscious attention to grammatical form aids their acquisition, particularly if there is also access to comprehensible input through meaning-focussed communication.

Having considered the weak objection to the claim that comprehensible input is necessary for acquisition, we can now turn our attention to the strong objection. This disputes the very necessity of comprehensible input. This objection is based on learnability theory. White (1987), for instance, has argued that some grammatical features cannot be acquired purely on the basis of positive evidence (i.e. comprehensible input) and require negative input (i.e. feedback that draws conscious attention to the existence of the features). She notes that learners not only have to add new rules but also to lose transitional rules and that many of the latter cannot be disconfirmed purely on the basis of input, no matter how well-adjusted it is. Rutherford (1989) points out that learners manifest 'near universal failure to attain full target language competence' (p. 442) and that this may be because preemption is blocked in L2 acquisition. Rutherford, like White, argues it may be necessary to bring the difference between the learner's interim rules and the target language rules to the learner's conscious attention. Zobl (1983) and Eckman (1985) have both argued that acquisition entails 'generalisation'. That is, learners are credited with the

ability to project grammatical knowledge they obtain from input to other, related grammatical knowledge not available or not attended to in the input. The gist of all these arguments is that input is not enough and that learners are equipped to go beyond the input.

The strong objection is able to muster some powerful arguments but little empirical evidence. In this respect it is not dissimilar to the interaction hypothesis itself. There is some evidence to support the capacity of learners to project beyond the input they receive (cf. Zobl, 1985; Eckman et al, 1988). But this evidence is open to challenge. The studies to date have not demonstrated that learners generalize what they have learnt to <u>new</u> grammatical features, merely that they are able to increase the accuracy with which they perform features they have already learnt on the basis of input containing other features (cf. Jones, 1991, for a study that lends some support to this position). The studies have also only investigated a very limited number of grammatical features - relative clauses and possessive pronouns - between which distinct markedness relations are believed to exist. We do not know whether and to what extent similar relations hold between other structures. Also, to date, the studies that have investigated projection have involved inducing conscious attention to specific grammatical features through formal instruction rather than supplying access to these features through comprehensible input.

The strong and weak theoretical objections to the central claim of the interaction hypothesis and the empirical research which sustains them give rise to doubts as to (1) whether comprehensible input is sufficient for acquisition and (2) whether it is always necessary. In general, the case for (1) is stronger than that for (2). The input hypothesis, as currently formulated, is probably not tenable. However, as White (1987) has noted, some kind of input hypothesis is clearly necessary

in any theory of L2 acquisition. In the next section a revised form of the input hypothesis will be proposed.

Do interactional adjustments make input comprehensible?

The second claim of the interactional hypothesis - that modifications to the interactional structure of discourse promote comprehension - rests on firmer ground, although it too is in need of some revision.

We have already examined the study by Pica, Young and Doughty (1986) and Pica's (1989) follow up study, which lend some support to the claim that interactionally modified input aids comprehension. A study by Loschky (1989) also indicates that opportunities for negotiating meaning are especially helpful where comprehension is concerned. Loschky investigated the acquisition of locative markers in L2 Japanese beginner learners. The learners were divided into three groups each of which received a different treatment. One group received baseline input, another premodified input and a third interactionally modified input. Loschky tested the learner's comprehension of sentences contaning the locative structures immediately after the treatment. He also tested their 'retention' of the structures by means of aural recognition and sentence verification tasks. The results demonstrated a clear advantage for the group that received interactionally modified input where comprehension was concerned, but no advantage for retention. Loschky also found a non-significant correlation between the learners' gains in comprehension and vocabulary gains. This study, then, indicates that for beginner learners opportunities to negotiate meaning results in better comprehension, but has no apparent impact on acquisition. As such, it bears out the discussion in the previous section.

The claim that interactional modifications aid comprehension has met with opposition, however. First, there is some evidence

to suggest that what appears to be the negotiation of meaning may not be anything of the kind. Hawkins (1985) carried out a study to determine whether the apparently appropriate responses made by learners in the course of negotiation actually signalled comprehension. She collected retrospective data from learners in order to determine whether their responses actually did represent comprehension and found that in 50% of the responses for which retrospective data were available comprehension had not in fact taken place.

Second, it has been pointed out that interactional modifications occur for other purposes than for negotiating meaning. Aston (1986) has argued convincingly for a social perspective on what he calls 'trouble shooting procedures' to complement the psycholinguistic perspective afforded by the interactional hypothesis. He notes that:

> Trouble shooting procedures can be employed to locate and deal with both troubles of accessibility and acceptability, and morover can be used when trouble is neither present nor imminent.

Thus, modification to the structure of interaction occurs when the participants need to achieve 'a formal display of convergence'. In such cases, Aston suggests, they may go through a 'ritual of understanding or agreement' in order to show that the interaction has been successful. Aston goes on the argue that excessive trouble-shooting procedures may jeopardize communication from a social point of view.

Third, following on from Hawkins' and Aston's observations, the claim that it is the quantity of interactional modifications that matters has been challenged. Ehrlich, Avery and Yorio (1989;399) argue that 'the mere number of meaning negotiations within an interaction may not be a good predictor of the quality of comprehensible input'. In an interesting study, they

compared the interactions of eight native speaker/native speaker dyads with those of eight native speaker/non-native speaker dyads in a problem solvng task requiring objects to be described. They found evidence for two relatively distinct styles in the speakers supplying the information. Skeletonizers provided the barest of details. Embroiderers tended to expand and embellish. Also, the skeletonizers tended to abandon negotiation when the descriptions strayed into a level of detail which the learners clearly could not handle, whereas the embroiderers carried on regardless. In the case of the NS/NS pairs, the style of the speaker did not affect overall success in the task, but in the case of the NS/NNS pairs it did; the skeletonizing pairs were more successful. Ehrlich, Avery and Yorio conclude that skeletonizing is more likely to result in comprehensible input. This study, then, indicates that it is not so much the quantity as the quality of interaction that counts. It goes some way to showing what particular aspects of negotiation facilitate comprehension.

Finally, we should also note that the research which has investigated interactional investigations has been extremely narrow. It has focussed on a very limited set of discourse functions found in negotiated interaction (cf. Table 1) and has neglected other aspects of discourse (such as topicalization) that may be important for comprehension. Also, it has been concerned primarily with discourse in English. We have no guarantee that the negotiation of meaning proceeds similarly in other languages. We do not know whether the same kinds of modifications occur cross-linguistically. A study by Kitazawa (1990) has reported considerable problems in identifying and classifying the interactional moves described by Long and Pica in Japanese conversations involving learners.

Two general conclusions seem possible regarding the relationship between interactional modifications and comprehension:

(1) Interactional modifications help learners to comprehend difficult material. They appear to aid comprehension to a greater extent than premodified input.

(2) Precisely when and how interactional modifications work for comprehension is still poorly understood, but it is becoming clear that it is the quality rather than the quantity that matters.

There is an obvious need for more studies (both descriptive and experimental) that probe the variables which determine whether and to what extent adjustments to discourse contribute to comprehension. Such studies will hopefully go beyond the fairly restricted set of interactional features which have figured in the research to date.[9] They will also need to investigate the nature and the effects of modifications in languages other than English. In the meantime some revision of part two of the interactional hypothesis is in order.

Revising the hypothesis

We have seen that only very limited evidence can currently be mustered in support of the interaction hypothesis. We have also seen that the hypothesis is open to serious challenge in two major ways. First, comprehensible input appears to be neither necessary nor sufficient for acquisition and second there appear to be conditions governing whether and when interactional modifications make input comprehensible. These constitute serious challenges, which cannot be ignored. One way forward might be to abandon the hypothesis and look for an alternative theory to explain how learners use input to build their interlanguages. This, in effect, is what White (1987) and others who view Universal Grammar as the key to explaining L2 acquisition have advocated. However, I do not think that abandonment is the best course or indeed necessary. For a start, the interactional hypothesis has made a valuable

contribution to classroom second language research, motivating a number of studies that have addressed both the nature of classroom interaction and also its relationship to learners' understanding and learning. Also, the hypothesis has strong face validity. As many teachers have pointed out to me, it is common sense to work on the assumption that making learners understand what you say to them will help them learn the L2. Revision rather than abandonment of the hypothesis is the path I favour.

What is missing from the hypothesis is a theoretical account of how input made comprehensible through interactional modification results in acquisition. The revisions that I wish to propose are based on such an account.

The process of acquiring an L2 involves three basic procedures: (1) noticing, (2) comparison and (3) integration. Noticing entails the learner attending consciously to linguistic features in the input. Noticing entails perception and storage in short term memory. Thus, a feature that is noticed becomes 'preliminary intake' (Chaudron, 1985). Comparison also entails only short term memory. It involves the learner in identifying the difference between features noticed in the input and features currently in her own output. Integration takes place when the learner constructs new hypotheses on the basis of comparing input and her own output and stores these in long term memory.
Integration, therefore, results in 'final intake' (Chaudron, 1985). For acquisition to take place, all three procedures must occur. It does not follow that because a learner has noticed some feature in the input and has carried out a comparison with her own output that integration will take place. It is now generally recognised that pscyholinguistic constraints of various kinds govern when new linguistic material is incorporated into the learner's interlanguage (cf. the Multidimensional Model,

Pienemann, 1989). These constraints, working at the level of integration, are responsible for the developmental orders which have been observed in L2 acquisition. The position I seek to advance is that the role of input derived through interaction is primarily that of facilitating the processes of noticing and comparison.

According to Schmidt (1990), the process of noticing is necessarily a conscious one. He claims that 'you can't learn a foreign language through sublimal perception'. Conscious noticing, however, is not the same as deliberate attending. Noticing can take place either intentionally or inadvertently. Also, noticing does not require focal attention. When taking part in a conversation, for instance, the learner may be primarily focussed on the message content, but may also pay peripheral attention to striking linguistic features in the input. Under certain conditions, the learner may bring these features into focal attention. Lennon (1989) has documented how the advanced learners he studied appeared to switch their attention backwards and forwards from trying to communicate to trying to learn by consciously attending to input features even within the course of a single interaction. Schmidt argues that learners who notice the most, will learn the most.

The process of comparison is also potentially a conscious one, although it may often take place subconsciously. Schmidt and Frota (1986) carried out a detailed study of Schmidt's acquisition of Portuguese based on his entries in an admirably detailed diary. They illustrate how Schmidt often 'noticed the gap' between what he typically said and what he observed in the input. Here is an example of the kind of comparison Schmidt reported carrying out:

> I often say *dois anos antes* for 'two years ago'. I think it should be *anos atras*. I have been hearing it that way in conversation, I think.

(Later the same day) I asked M which is correct and he says both are OK, but I am suspiscious. Check with S tomorrow.

Schmidt and Frota provide several examples of how features that were noticed in the input and compared to current output subsequently appeared productively in Schmidt's conversational output. In fact, out of 21 verbal constructions they investigated, 20 were reported as having being noticed prior to their use in spontanous production.

Of key interest is what induces a learner to notice features in the input and then to compare them to her current output. It is here that a role for comprehensible input and interaction appears likely. Modified input may be effective in drawing a learner's attention to features that would otherwise be ignored. This might occur in two principal ways - by increasing the frequency of specific forms at particular times (cf. Wells, 1985) and also by constructing messages in such a way that certain features become prominent in the input (e.g. by placing them in utterance initial position). Simplified input will only instigate noticing providing the learner is attending to it and this in turn is more likely to occur if the learner is able to understand the message content. As several studies have shown, beginners are not generally successful in learning from unsimplified input such as that made available through TV or radio (cf. Snow et al, 1976). This is because such input is not comprehensible and so does not facilitate the noticing process. Simplified input does not ensure that noticing will take place, however. For one thing, if the input is simplified too much, there may be nothing new to notice. Also, the learner may be so focussed on message that she has no time to attend to linguistic features.

Negotiated interaction may be particularly useful in both helping the learner to notice new features and also to carry

out a comparison with her existing output. Consider the following (again contrived) interaction:

NNS: No go disco this Saturday.
NS: Oh, so you're not going to the disco this Saturday?
NNS: Yeah, not going.

In such an exchange the native speaker reformulates the learner's utterance in the guise of a confirmation check and one feature of this reformulation is taken up in the learner's reponse. Such interactions afford the learner overt comparisons between interlanguage and target language forms. Of course, there is no guarantee that overt comparisons lead to the kind of mental comparison which Schmidt hypothesizes is necessary, but they surely create the conditions under which such mental comparisons are more likely to occur. Thus modified interaction does not guarantee that noticing or comparison will take place; it merely facilitates it. Also, as we have already seen, certain kinds of modified interaction may work better for comprehension and thereby for noticing than others (cf. Ehrlich, Avery and Yorio, 1989).

The processes of noticing and comparison, then, may be facilitated when input is comprehensible and when interactional modification is possible. It is important to recognize, however, that there are likely to be a number of factors in addition to interactional modification that govern if and when these acquisitional processes take place (cf. Schmidt, 1990). The following is a provisional list of such factors:

(1) task demands (i.e. the instructional task causes the learner to attend to certain linguistic features because these are important for acquisition).

(2) unusual features (i.e. features that surprise the

learner. Such features may work in similar ways to deviations in literary texts).

(3) markedness (i.e. features that are relatively unmarked may be easier to notice than features that are more marked).

(4) the learner's L1 (i.e. L2 features that match L1 features may be more noticeable, at least in the earlier stages of acquisition).

(5) individual learner differences (i.e. factors such as aptitude and motivation may influence whether or not a learner attends to new linguistic features in the input).

Whether or not these factors are important for noticing and comparing and in what ways remains an empirical question. What is important to recognise is that within the overall theory being proposed the availability of comprehensible input and of opportunities for negotiating meaning do not ensure that these processes will take place.

The role of comprehensible input and interactional modifications where integration of new linguistic material into interlanguage is concerned is less clear. The comprehensibility of input may prove to be irrelevant for integration. However, it is possible that interaction that enables the learner to use those features that have been noticed and compared in output may help. Such a position is compatible with the more recent work on negotiated interaction which has sought to show how learners can be 'stretched' by obliging them to make their own output more comprehensible (see earlier discussion). But there is a strong liklihood that the integration of new structures depends to a large extent on factors other than input or output (e.g. innate knowledge of the universal properties of language and the learner's L1).

The theoretical position which has now been outlined suggests a number of revisions of the interactional hypothesis are in order. First, it is necessary to make a much weaker claim on behalf of comprehensible input. It must be seen as playing a facilitative rather than a necessary role in acquisition. Also due recognition must be given to the fact that the acquisition of some linguistic structures can occur independently of input. Second, modified input is seen as important for acquisition but only in the sense that it makes acquisition possible, not in the sense that it causes acquisition to take place. The conditions under which modified input may work need to be specified. Thus, it is hypothesized that modified input plays a part in enabling learners to carry out the preliminary processes of acquisition - noticing and comparison. The special usefulness of modified input derived from negotiating communication problems is also acknowledged. Third, a role for output is incorporated into the hypothesis, along the lines currently proposed by Pica and Long. Output is seen as a mechanism that facilitates the integration of new linguistic knowledge. It follows that situational conditions and tasks that promote interaction which produces comprehension and which encourages the processes of noticing, comparison and integration will be effective for acquisition. However, as little is currently known about what situations and tasks achieve this, no reference to external factors is incorporated into the revised hypothesis.

Conclusion

The focus of this paper has been the role played by face-to-face interaction in L2 acquisition. The interaction hypothesis, as proposed initially by Long and investigated by Pica, has served as the main theoretical account of this role. A number of problems with this hypothesis have been identified and a revised interaction hypothesis has been put forward. This claims that the comprehensible input derived from

(1) Comprehensible input facilitates L2 acquisition but is neither necessary not sufficient.

(2) Modifications to input,especially those which take place in the process of negotiating a communication problem make acquisition possible providing that the learners:

a. comprehend the input

b. notice new features in it and compare what is noticed with their own output.

(3) Interaaction that requires learners to modify their initial output facilitates the process of integration.

Table 4: A revised version of the interactional hypothesis

modified interaction may facilitate the processes of noticing linguistic features and comparing them with the features the learner derives from her current interlanguage. It also claims that learner production resulting from the attempt to negotiate meaning can facilitate the process of integrating new features into interlanguage. These claims are weaker than the claims of the original hypothesis. Comprehensible input, for instance, is seen as neither necessary nor sufficient for acquisition. However, they are compatible with the results of empirical and theoretical enquiry into L2 acquisition.

One advantage of the revised hypothesis is that it is possible to see how it can be tested empirically. The absence of direct evidence in support of the original hypothesis is a reflection of the difficulty researchers have faced in testing it. Long (1985) suggested that the hypothesis might be tested indirectly by (1) showing that linguistic and conversational adjustments promote comprehension of input, (2) showing that comprehensible input promotes acquisition and (3) inferring that linguistic/conversational adjustments promote acquisition. But this suggestion has not proved very helpful as it is not clear how (2) can be achieved. The revised hypothesis does not face this difficulty because the relationship between input, comprehension and acquisition has now been more clearly defined. The nature of the link between modified input and the processes of noticing and comparing can be tested through introspection and retrospection because both of these processes take place at a conscious level. One way is by asking learners to record what it is that they remember having noticed while they were performing a particular task and then examining the nature of the interactions in which the noticed features occurred (cf. Slimani, 1987, for an account such a methodology)[10].

Finally, I would like to join the many other researchers who have advised caution in applying the results of SLA studies to

language pedagogy (cf. Lightbown,1985). It is highly desirable,as Long (1987) has pointed out,that language pedagogy should be informed by research that is 'theoretically motivated' and has 'high valency' (i.e. capable of generalization beyond the specific context of the research site). The problem is that in such a young field as SLA there is no agreeement regarding what constitutes a valid theory. As a result the research that has taken place,including the research based on the interaction hypothesis,affords few certainties. Such research cannot in my view be used to inform pedagogy. It is surely unwise,for instance,to propose that teachers select tasks according to how many interactional modifications they give rise to (cf. Long and Crookes,1987)),given how little we know about the relationship between these modifications and acquisition. The research should serve as a means (and not the only means) of illuminating language pedagogy by drawing attention to possible lines of intervention which teachers can then test out,ultimately accepting or dismissing them in the light of their classroom experience.

Notes:

1. Parker and Chaudron (1987) suggest that some characteristics of the speech addressed to learners do not reflect either input or interactional modification. They propose a third category of features which they label 'elaboration'. This includes modifications that involve redundancy (e.g.repetition of constituents,use of synonyms and rhetorical framing) and those that involve thematic structure (e.g. extraposition and cleft constructions).

2. Swain (1985) argues that output encourages acquisition by forcing learners to be precise,coherent and appropriate,by obliging them to to process syntatically (as opposed to semantically) and by providing opportunities for them to revise hypotheses. The evidence cited in support of the output hypothesis is circumstantial (i.e. there is no direct evidence linking 'pushed output' to acquisition).

3. The Parker and Chaudron (1987) study did attempt to establish to what extent modifications involving redundancy and thematic structure differentially contributed to reading comprehension,but found no effect for either.

4. Pica's(1989) study also investigated whether interactional modifications work as well for learners who listen to others interact as it does for those who actively participate. She found no statistical difference between the comprehension of the listeners and the participators.

5. The evaluation focuses on the first two parts of the hypothesis as it is these that are essential. Part three functions only as a corollary.

6. It is interesting to note that neither White nor Sharwood Smith make any mention of other forms of adjustment in input to learners (i.e. interactional or elaboration). They discuss only simplified input. It is not possible, of course, to dimiss a role for modified input by arguments that address only simplified input.

7. Vertical construction and incorporation (Hatch and Wagner-Gough, 1976) may serve as discourse strategies which help the learner to acquire syntactical structures. However, it is not clear how such strategies could facilitate the acquisition of morphological structures.

8. The baseline input in Loschky's study consisted of unmodified input derived from performing the task with native speakers.

9. Bygate's (1988) analysis of the kinds of interactions that take place in small group work involving learners of mixed proficiency levels suggests how the study of interaction can be taken further than the small set of of discourse functions which the interaction hypothesis centres around. Bygate examined the forms and functions of what he calls 'satellite units' (i.e. chunks of language that are dependent on some previous part of the discourse). Bygate claims that these units facilitate the process of language acquisition, although he offers no evidence to demonstrate this.

10. Slimani recorded six lessons involving a non-native speaker teacher and intermediate learners of English in an Algerian technical college. She asked the learners to fill in an uptake chart, in which they recorded which items they had learnt during the lessons. Slimani then sought to identify where the items recorded occurred in each lesson and to examine the interactional properties

that might have led to their recall. Slimani found no relationship between modified interaction and recall. However, given that the lessons were all very teacher-centred and afforded little opportunity for negotiation her study cannot be considered a good test of the revised interactional hypothesis.

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